



Curtis Specialty Papers Site Milford, New Jersey

September 23, 2013 CAG Meeting

Baseline Human Health Risk Assessment

- **Objective**

- Evaluate potential human health risk/hazard associated with exposure to constituents in soil, sediment, water, air, fish

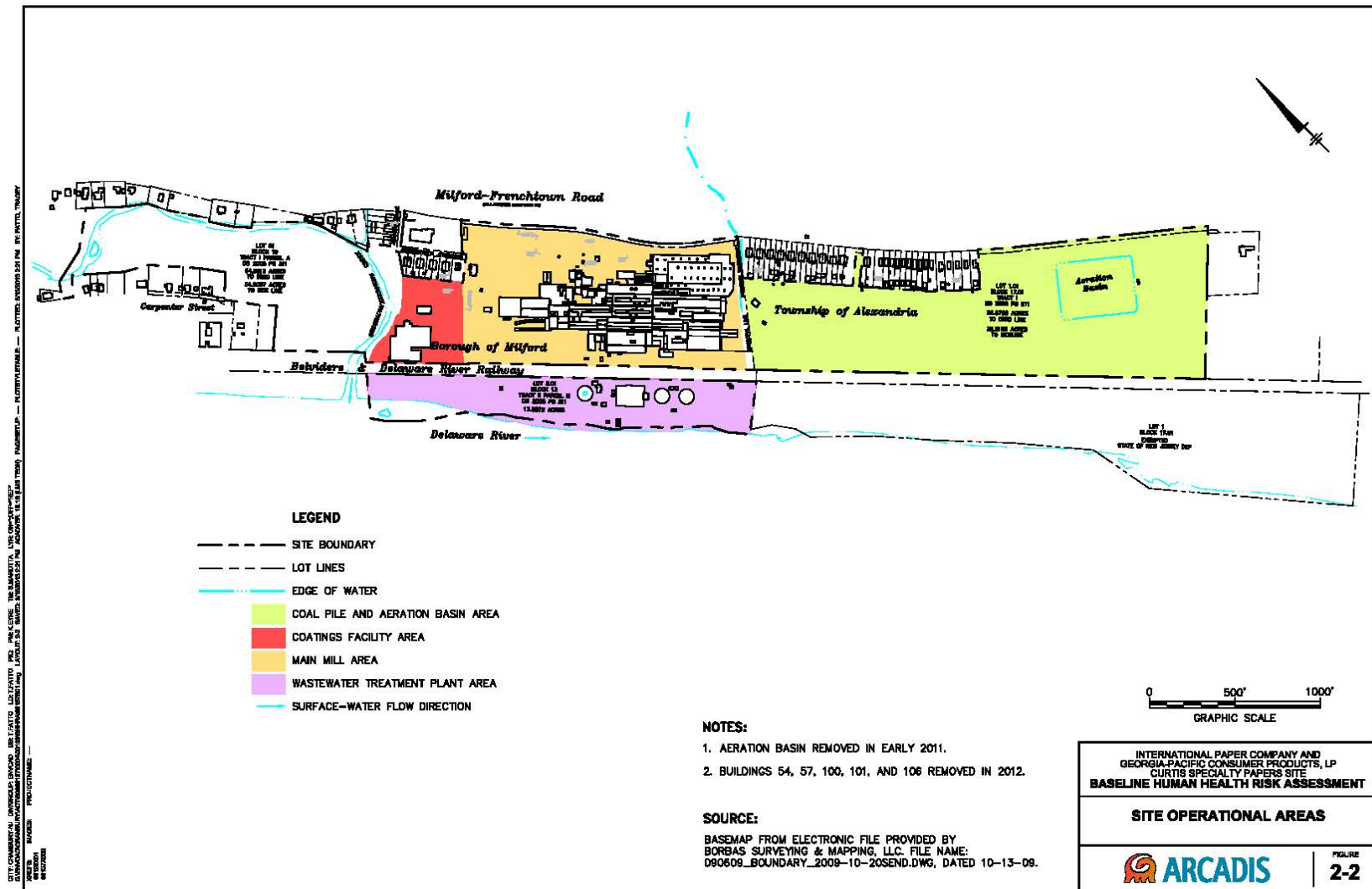
- **Areas of interest**

- Upland soil (including constituents/dust in ambient air)
 - Floodplain/bank soil
 - Surface water/sediment
 - Edible fish tissue
 - Groundwater (including emissions to air)

- **Potential areas of exposure**

- Coatings Facility Area (CFA)
 - Main Mill Area (MMA)
 - Wastewater Treatment Plant Area (WWTPA)
 - Coal Pile and Aeration Basin Area (CPABA)
 - Q Creek, unnamed tributary, Delaware River

Four Former Operational Areas



BHHRA - USEPA Process

- **Identify data** from USEPA, RI, and Slope Area Mitigation (SAM) sampling to represent current conditions
- **Identify constituents** of potential concern (COPCs)
 - Based on comparison of site data to USEPA risk-based screening levels
- **Assess potential exposure** – identify receptors, exposure pathways, and associated exposure factors (e.g., soil ingestion rate, exposure frequency)
- **Assess potential toxicity** – identify USEPA toxicity values to use in risk characterization
- **Characterize risk** – estimate potential carcinogenic risks and non-carcinogenic hazards for each receptor

Identify Data/COPCs

- Groundwater
 - Collected in 2010 (RI) and 2013 (SAM)
 - Chemicals of Potential Concern (COPCs) = Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), metals
- Upland and floodplain/bank soil
 - Surface soils = 0 to 1 foot below ground surface (bgs)
 - Subsurface soils = 1 to 10 feet bgs
 - Collected in 2007 (USEPA), 2010/2012 (RI) and 2013 (SAM)
 - COPCs = VOCs, Polycyclic Aromatic Hydrocarbons (PAHs), PCBs, pesticides, dioxins, metals
- Sediment
 - Collected in 2007 (USEPA) and 2010 (RI)
 - COPCs = PAHs, PCBs, metals
- Surface water
 - Collected in 2010 (RI)
 - COPCs = PCBs (Delaware River only) and metals

Assess Potential Exposure - Receptors

- Based on land use, site-specific observations, professional judgment and consultation with USEPA
- Current
 - Off-site residents along Frenchtown Rd and Delaware Ave
 - People engaged in recreational activities
 - Anglers fishing in Q Creek/ Delaware River
- Future
 - Indoor commercial/industrial workers
 - Groundskeepers (responsible for site maintenance, mowing)
 - Construction workers
 - Persons occupying Redevelopment Area in 2004
Borough of Milford Redevelopment Plan (15.8- acre overlay on CFA/MMA/WWTPA)

City SYR DocGroup SED GIS Created By J RAPP Last Saved By japp
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Assess Potential Exposure - Pathways

- Soil – ingestion, dermal contact, inhalation
- Sediment – ingestion, dermal contact
- Surface water – ingestion, dermal contact
- Groundwater – ingestion, dermal contact, inhalation
- Fish - ingestion

Assess Potential Exposure – Receptors and Pathways

12/28/2011 GRM
CURTIS SPECIALTY PAPERS (B0066137.0003.00107)
G:\PROJECTS\GEORGIA PACIFIC\CURTIS PAPERS\REPORTS AND PRESENTATIONS\BBHRA\FIGURES\BBHRA FIG ES-1.pptx

Source	Area (1)	Exposure Medium	Exposure Route	CURRENT		FUTURE				
				RECREATOR (2)	OFF-SITE RESIDENT (3)	ON-SITE RESIDENT (4)	COMMERCIAL/ INDUSTRIAL WORKER (5)	GROUND-KEEPER (5)	CONSTRUCTION WORKER (5)	
Curtis Specialty Papers Site	Q Creek	Floodplain/Bank Soil	Ingestion, Dermal, Inhalation (6)	●	X	X	X	X	X	
		Sediment	Ingestion, Dermal	●	X	X	X	X	X	
		Surface Water	Dermal	●	X	X	X	X	X	
	Q Creek	Fish (7)	Ingestion	●	X	X	X	X	X	
	Delaware River	Fish (7)	Ingestion	●	X	X	X	X	X	
	Wastewater Treatment Plant Area	Upland Surface Soil	Ingestion, Dermal, Inhalation (6)	●	X	X	X	X	X	
		Sediment (DR)	Ingestion, Dermal	●	X	X	X	X	X	
		Surface Water (DR)	Ingestion, Dermal	●	X	X	X	X	X	
	Coal Pile and Aeration Basin Area	Upland Surface Soil	Ingestion, Dermal, Inhalation (6)	●	●	X	X	X	X	
		Floodplain/Bank Soil (UT)	Ingestion, Dermal, Inhalation (6)	●	X	X	X	X	X	
		Sediment (UT)	Ingestion, Dermal	●	X	X	X	X	X	
		Surface Water (UT)	Dermal	○	X	X	X	X	X	
	Main Mill Area	Upland Surface Soil	Ingestion, Dermal, Inhalation (6)	●	X	X	●	●	●	
		Upland Subsurface Soil	Ingestion, Dermal, Inhalation (6)	X	X	X	X	X	●	
	Coatings Facility Area	Upland Surface Soil	Ingestion, Dermal, Inhalation (6)	●	●	X	●	●	●	
		Upland Subsurface Soil	Ingestion, Dermal, Inhalation (6)	X	X	X	X	X	●	
	Site-wide	Groundwater	Inhalation (Indoor Air)	X	○	●	●	X	X	
			Inhalation (Trench Air)	X	X	X	X	X	●	
			Ing., Der., Inh. (Tap water) (6)	X	X	●	X	X	X	
	Residential Redevelopment Area (8)	Upland Surface Soil	Ingestion, Dermal, Inhalation (6)	X	X	●	X	X	X	

LEGEND:

●	POTENTIALLY COMPLETE EXPOSURE PATHWAY EVALUATED QUANTITATIVELY.
○	POTENTIALLY COMPLETE EXPOSURE PATHWAY EVALUATED QUALITATIVELY.
X	POTENTIALLY INCOMPLETE EXPOSURE PATHWAY; WILL NOT BE EVALUATED.

ABBREVIATIONS:
DR = DELAWARE RIVER
Q CREEK = QUEQUACOMMISSACONG CREEK
UT = UNNAMED TRIBUTARY TO THE DELAWARE RIVER

NOTES:
(1) AT USEPA'S REQUEST, RISKS WILL BE ESTIMATED FOR EACH RECEPTOR ON AN AREA BASIS.
(2) RECREATOR INCLUDES ADOLESCENT (AGED 5 TO 18 YEARS OLD) AND ADULT (AGED 18 YEARS OLD AND OLDER) HIKING IN TERRESTRIAL AREAS, WADING OR SWIMMING IN AQUATIC AREAS AND/OR FISHING IN AQUATIC AREAS.
(3) OFF-SITE RESIDENT INCLUDES CHILD (AGED 1 TO 6 YEARS OLD) AND ADULT (AGED 7 TO 30 YEARS OLD) LIVING ALONG DELAWARE AVENUE OR FRENCHTOWN ROAD.
(4) RESIDENT INCLUDES CHILD (AGED 1 TO 6 YEARS OLD) AND ADULT (AGED 7 TO 30 YEARS OLD) LIVING IN FUTURE ON-SITE RESIDENCES.
(5) RECEPTOR INCLUDES ADULT (AGED 18 YEARS OLD AND OLDER) WORKING ON SITE CONDUCTING OFFICE WORK, OUTDOOR MAINTENANCE OR CONSTRUCTION.
(6) INHALATION EXPOSURE INCLUDES FUGITIVE DUSTS AND/OR VOLATILES IN AMBIENT AIR AND/OR INDOOR AIR.
(7) FISH TISSUE CONCENTRATIONS WILL BE MODELED FROM SEDIMENT FOR BIOACCUMULATIVE COMPOUNDS.
(8) RESIDENTIAL REDEVELOPMENT AREA REFERS TO APPROXIMATELY 13 ACRES OF RESIDENTIAL AREA AND 2.8 ACRES OF MIXED USE AREA IDENTIFIED IN BOROUGH OF MILFORD'S 2004 REDEVELOPMENT PLAN.

INTERNATIONAL PAPER COMPANY AND
GEORGIA-PACIFIC CONSUMER PRODUCTS, LP
CURTIS SPECIALTY PAPERS SITE
**BASELINE HUMAN HEALTH
RISK ASSESSMENT**
**SUMMARY OF EXPOSURE
PATHWAYS**

Characterize Risk -Process

- Combine exposure and toxicity assessments
- Estimate 'excess lifetime cancer risk' - probability of developing cancer over lifetime as a result of exposure
 - USEPA risk range = one-in-ten thousand (10^{-4}) to one-in-one million (10^{-6})
- Estimate non-cancer hazards based on systemic (target organ) effects
 - USEPA level = 1
- Estimate Lead risks with USEPA model that predicts blood lead levels based on exposure
 - Compare to target blood lead level - 5% of population above 10 micrograms per deciliter (ug/dL)

Characterize Risk - Results

- Majority of exposures at acceptable levels relative to USEPA levels for potential carcinogenic risk and non-carcinogenic hazard
- Exposure to lead in soil less than USEPA target blood level
- Potential risks and hazards above USEPA levels:
 - WWTPA swimmers exposed to PCBs in Delaware River surface water
 - Single detection of PCBs (Aroclor 1260) in USEPA 2007 sampling event
 - Delaware River - large, dynamic system
 - Q Creek anglers exposed to PCBs in fish tissue modeled from sediment
 - Maximum PCB concentration from USEPA 2007 sampling event
 - Soil removal from CFA eliminated PCB source
 - Potential future on-site potable groundwater use
 - VOCs and metals
 - Arsenic comparable to regional background, likely naturally occurring
 - Delaware River anglers exposed to PAHs in fish tissue modeled from sediment
 - Background (upriver) sediment PAH concentrations similar to site